

Science Sample Activities*

Standard: The adult learner applies methods of science and technology toward the advancement of personal and community well being.

Indicator A: Understands and uses the processes of scientific investigation and scientific ways of knowing. Able to design, conduct, describe and evaluate these investigations. Understands and applies concepts that unify scientific disciplines (Science as Inquiry)

	Family	Workplace	Community
Pre-Literacy	Students identify and use safe procedures in storage and use of chemicals in the home.	Students identify the snacks in a vending machine and sort them by different characteristics (e.g., taste, color, color of package, price). Determine how many ways they can be grouped together.	Students investigate how many ways duct tape can be used for problem solving. Compare duct tape to other tapes in terms of physical properties, including strength, durability, and function.
ABE I	<p>Students pick a room, closet, cabinet, or drawer. Sort and classify contents into groups according to physical properties (e.g., size, weight, color, texture, shape). Determine how many ways they can be grouped together.</p> <p>Students identify basic parts of a simple familiar system (e.g., clock, bike, park) and describe the relationship between the parts.</p>	<p>Students sort items on a desktop or from within a desk drawer. Classify content into groups according to physical properties (e.g., size, weight, color, texture, shape).</p> <p>Students apply knowledge that objects are made out of different materials (paper, cloth, plastic, metal, wood, stone, glass) by identifying an object (or part of one) composed of each type.</p>	Students conduct an experiment to determine which brand of paper towel is the best in terms of form and function, cost, and personal preference, and write an advertisement for the brand highlighting the findings of the experiment. (<i>M – ABE I:B,E2</i>); (<i>W – ABE II: B4&5</i>)
ABE II	Students evaluate the family's water intake. Collect data of how many 8-ounce glasses of water they drink over the next 24 hours. Graph the results for the family. Devise a plan to ensure that everyone is taking in at least six glasses of water daily. (<i>M – ABE II: B, E2</i>)	Students collect data comparing preferences of coworkers using a survey of ten categories that offer two options (e.g., smoking/non-smoking, soda/coffee, cookies/chips). Make predictions about larger groups for each category. Use results to check your predictions. (<i>M – ABE I & II: B</i>)	Students research a biological hazard (viral, bacterial, or parasitic) that has affected the community. Investigate and identify the cause, symptoms, and treatments or cures. Identify risk factors and precautions people should take to protect themselves. Compare local with national risk factors. (<i>R – ABE II: B</i>)

***Sample activities incorporate the core competencies of communication, interpersonal and critical-thinking skills.**

ASE I / II	Students keep a written record for one week of all food and drink they consume. List approximate amounts and categorize each entry as basically protein, carbohydrate or fat. (<i>M – ASE I: B</i>); (<i>R – ASE II: B4</i>)	Students create a chart showing the hierarchy of responsibility for a business, school or church to illustrate the interrelationship of each member to others. (<i>M – ASE I: B1</i>)	Students identify a community environmental problem, list several proposed solutions and evaluate the consequences to each faction within the community. Students identify a local facility that is science-based (e.g., water/sewage treatment plant, planetarium, Audubon Society, arboretum) and investigate the types of activities that transpire within.
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Indicator B: Understands the impact of science and technology on human activity and the environment as it relates to the past, present and Future (Science and Technology – Past, Present and Future)

	Family	Workplace	Community
Pre-Literacy	Students describe a technological device and how it affects their daily life.	Students identify examples of simple technology (e.g., paper clip, scissors, zipper) and describe how they are used in the workplace.	Students explain why people should wash their hands before and during food preparation and consumption.
ABE I	Students invent new uses for used items. Identify items in the home that can be recycled by reusing them in other ways (e.g., coffee cans can be used to store nails and screws, large pickle jars can be used to store sugar and flour). Be creative.	Students identify technological objects and describe how work might be done differently if these things had not been invented. Explain how the type of work and/or workload might be different and whether the same work would require hiring more employees. Students explain how the form or shape of objects and equipment in the workplace is frequently related to its use, operation, or function (e.g., stapler, scissors, screwdriver, chisel, etc.).	Students identify occupations in the community that require the application of science and technology. Interview someone who works in one of these occupations. Find out how many science/technology-related courses were required to work in that position. Ask a variety of questions to gather information about the job (e.g., How is science and technology used at this job? Is there a training period? If so, how long is it? Is continuing education a requirement of this job?)

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ABE II	<p>Students evaluate how technological inventions have impacted life in the home (e.g., computers, the Internet, cable/digital cable television, DVD players, etc.). List the changes these have or can make on one's lifestyle, positive and negative. (<i>W – ABE II: B3</i>)</p> <p>Students prepare a timeline that shows changes in the way we communicate. (<i>M – ABE II: B</i>); (<i>W ABE III: B2</i>)</p>	<p>Students identify major scientific contributions that have had a direct impact on how work is done at the workplace/office (e.g., pagers, cellular phones, laptop computers, FAX machines, etc.).</p> <p>Students investigate the cost of bringing in new or updating current technological items (e.g., computers, software programs, printers, Xerox machines) in the workplace/office. Determine and compare the advantages and disadvantages. Use findings to support or refute recommendations for purchase. (<i>M – ABE III: B</i>); (<i>W – ABE II: B2</i>)</p>	<p>Students investigate the ways that law enforcement agencies use science and technology to solve crimes in the community. (<i>R – ABE II: B5,6&7</i>)</p> <p>Students compare the advantages and the disadvantages of the invention of this Internet. Describe how the Internet has affected human activity. Investigate the history of the Internet and make a prediction about how the Internet will be in the future. (<i>M – ABE II: B</i>); (<i>R – ABE II: B4; ABE III: B2</i>)</p>
ABE III	<p>Students evaluate the claims and potential risks and benefits of an advertised product (diet plan, tooth cleaner, over the counter drug, etc.). (<i>R – ABE III: B; ASE I: B</i>)</p>	<p>Students conduct a field research project to compare the distribution of birds near the school with a field guide for the region to see if local distributions are the same as regional.</p>	<p>Students hypothesize why people get more colds and flu during the winter and discuss ways to prevent the spread of illness.</p> <p>Students prepare a timeline showing when different subatomic particles were discovered. (<i>M – ABE II: B</i>); (<i>W – ABE III: B2</i>)</p>
ASE I / II	<p>Students identify a machine or appliance used in their home and list the ways it has affected their life. Describe how life would be affected by removing any three technological products from their home. (<i>W – ASE I: B3</i>)</p>	<p>Students describe ways in which technology used in their workplace has affected the environment. (<i>W – ASE I: B2</i>)</p>	<p>Students interview community leaders to assess their plans to accommodate the population after a natural disaster. (<i>W – ASE I: B2</i>); (<i>R – ASE II: B</i>)</p> <p>Students compare and contrast the benefits and risks of genetic engineering. (<i>W – ASE I: B2</i>)</p>

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Indicator C: Understands the characteristics of living things, the diversity of life and how organisms change over time in terms of biological adaptations and genetics. Understands the interrelationships of matter and energy in living organisms and the interactions of living organisms with their environments (Life Science)

	Family	Workplace	Community
Pre-Literacy	Students describe safe food storage and handling procedures and reasons for doing so.	Students explain the impact of food and sleep on the body, and explain how it relates to work performance and safety in the workplace.	Students plan the supplies and equipment needed for a camping trip and explain their purposes. (<i>W – PL: B2</i>)
ABE I	<p>Students identify and list how family members are both similar and different. Identify traits that are inherited (e.g., eye color, hair color, nose shape) and those that might be from interaction with the environment (e.g., bike-riding ability, ability to play a sport or an instrument, etc.).</p> <p>Students describe what happens when a healthy plant is placed in a dark closet for a week. Explain the importance of sunlight with regard to how plants stay healthy and green. (<i>W – ASE II: B5</i>)</p>	<p>Students conduct an experiment to find out which of their co-workers have the inherited characteristic the ability to roll their tongue and which ones do not. Make a prediction about which will be the larger group. Use results to check your prediction. Report findings. (<i>M – ABE I: B</i>); (<i>W – ABE II: B5</i>)</p> <p>Students compare two popular snacks from the vending machine at work. Compare the cost, taste, calories, fat content, etc. Make a prediction on which one sells faster. Observe the machine daily to check prediction. (<i>M – ABE II: B</i>)</p>	<p>Students identify ways that humans depend on their natural and constructed environments where they live. Investigate things people can do to protect and preserve the natural environment, as well as things to maintain the structures they depend on in their constructed environment. (<i>W – ABE II: B6&7</i>)</p> <p>Students compare and contrast the various ways diseases are transmitted from one person to another. (<i>W – ABE I: B3</i>)</p>
ABE II	<p>Students analyze the frequency of physical fitness activities for each family member over the next week. Devise a plan to incorporate physical fitness activities into the family's current lifestyle at least three times per week.</p> <p>Students use the Food Guide Pyramid (USDA) to plan nutritionally balanced meals for the family's breakfast, lunch, dinner menus for the week. Investigate healthy snacks to eat in between meals.</p> <p>Students recognize characteristics of plants that show adaptations to their environments.</p>	<p>Students investigate which plants grow best in an office with no windows. Which plants grow well with artificial lighting? Make recommendations to purchase plants to brighten the offices with no windows.</p> <p>Students compare the effects of eating a carbohydrate-based snack (e.g., apple, crackers, chips) versus a protein-based snack (a snack with at least 10 g of protein). On one day eat the carbohydrate snack, and record how they feel in half-hour intervals. Note the time they start to feel tired and the time they start to feel hungry. The next day, repeat this with the protein snack. Compare the results. (<i>M – ABE II: B</i>); (<i>W – ABE II: B5</i>)</p>	<p>Students investigate plants that are used to treat medical conditions and diseases, such as cancer. Use the Internet, books, and periodicals to help with research. Which parts of a plant can be used to make medicine? How are plants made into medicine? How many types of these medicines could they find? Have they ever used a medicine that was made from a plant? (<i>R – ABE II: B6&7</i>)</p> <p>Students investigate Fetal Alcohol Syndrome and Fetal Alcohol Effects. How are these two the same? How are they different? (<i>W – ABE III: B2</i>)</p>

ABE III	Students compare eye colors of family members for as many generations as possible, noting dominant traits, and determining as best as possible for parents and grandparents if homozygous or heterozygous.	Students identify a pest in the immediate environment, and use an understanding of food webs to propose and test a way to eliminate the pest without introducing environmental poisons. (<i>W – ASE I: B4</i>)	Students survey (sample) the local community to see how many possess certain inheritable traits (tongue rolling, ear wiggling, widow's peak, chin cleft, etc.) to determine dominance or recessiveness of traits. (<i>M – ABE III: B</i>) Students compare the benefits of DDT with the risks and effects on wildlife. (<i>W – ASE I: B2</i>)
ASE I / II	Students write a week's menu that provides all the appropriate nutrients for optimum function of the bodily systems. (<i>W – ASE I: B4</i>) Students compare and contrast a plant with an animal (e.g., rattlesnake/Saguaro cactus). (<i>W – ASE I: B2</i>)	Students conduct an experiment to determine the effects of light, noise and temperature on worker efficiency. (<i>W – ASE II: B1</i>)	Students create an ecosystem of at least five species, and document how an environmental change affects each species. Students prepare a timeline that shows the history of medical treatments for diseases and wounds. (<i>M – ABE I: B1a</i>); (<i>W – ABE III: B2</i>)

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Indicator D: Understands the nature of matter and energy including their forms, the changes they undergo and their interactions (Physical Science)

	Family	Workplace	Community
Pre-Literacy	Students measure the amount of time it takes for an apple slice to change color, and compare it to a potato slice. (<i>M – PL: E1</i>)	Students compare the mass and volume of items to be safely stored in a storage cabinet or shed. (<i>M – PL: E; ABE I: D4&5</i>)	Students predict the bouncing pattern of a basketball under different throwing conditions using previous observations of force and motion. (<i>M – PL: C1</i>)
ABE I	<p>Students predict which items in their house are magnetic, and use a refrigerator magnet to check predictions.</p> <p>Students compare usage of electricity from month to month, using the electricity company's billing statement. Determine ways to decrease the family's use of electricity. (<i>M – ABE I: B</i>)</p> <p>Students identify items in the home that are flammable and/or volatile. Practice safety in the storage of and use of these items. Devise a fire safety plan, which includes escape routes from each room in the house.</p>	<p>Students describe how electricity produces heat, light, sound, and magnetic effects in the workplace. Explain the impact of electricity on workplace activities. (<i>W – ABE II: B3</i>)</p> <p>Students compare the amount of effort it takes to carry objects from one point to another, as opposed to putting them on a cart or chair with wheels and pushing it.</p>	<p>Students compare the momentum of several different types of balls (e.g., tennis ball, baseball, volleyball, basketball, ping pong ball, football, soccer ball) down a sloped surface. Predict which type would be the fastest/slowest, as well as which type would roll the shortest/longest distances. Check predictions with results. <i>9W – ABE II: B5</i>)</p> <p>Students compare the frequency, length, and speed of a swing to a pendulum. (<i>M – ABE I & II: E</i>)</p>

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ABE II	<p>Students identify and describe chemical and physical changes that take place when cooking different foods.</p> <p>Students identify and list common mixtures (e.g., milk, baking mix, garlic salt, lemon pepper, Raisin Bran), and identify common compounds (e.g., salt, sugar, cleaners of all types).</p> <p>Students slice a number of different fruits and vegetables into pieces that measure the same size. Make predictions about which ones will float. Test each piece separately in a bowl of water. Check results with original predictions. <i>(M – AE II: B)</i></p>	<p>Students identify simple and complex machines used in the work environment.</p> <p>Students investigate the effect of magnetism on computers. Identify items that contain magnets or strong electromagnetic fields, and make recommendations for keeping these items away from computers in the workplace. <i>(W – ABE II: B3)</i></p> <p>Students explain the importance of fuses and circuit breakers. Investigate safety hazards involved in using electricity, and describe safe ways to use electricity. <i>(W – ABE II: B3)</i></p>	<p>Students investigate solar energy as an alternative to using electricity. Determine the advantages and disadvantages of using ONLY solar energy. Identify changes people can make to their homes to utilize solar energy and reduce the amount of electricity that they use.</p> <p>Students investigate food additives (e.g., artificial sweeteners, artificial emulsifiers, preservatives). Compare the advantages to the disadvantages of having chemicals in the foods that we eat. Research health risks associated with food additives. <i>(W – ABE II: B3&5)</i></p>
ABE III	<p>Students examine, build, and/or repair simple mechanical device (bicycle, part of car, grandfather clock) and describe how it works.</p> <p>Students use knowledge of wave frequency and pitch to compare and purchase stereo speakers.</p>	<p>Students conduct an energy audit of the workplace and develop procedures for reducing waste (of energy).</p>	<p>Students explain the difference between recycling and reusing in terms of mass and energy conservation. <i>(W – ABE III: B2)</i></p> <p>Students compare the benefits and risks of nuclear energy. <i>(W – ASE I: B2)</i></p>
ASE I / II	<p>Students trace solar energy to its use by living organisms.</p>	<p>Students determine how different kinds of construction materials would affect the cost, quality and usefulness of home or office furniture. <i>(R – ASE II: B2&4)</i></p>	<p>Students list reasons why an urban area has severe air quality measurements, and list potential solutions and their consequences to community members.</p>

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**Indicator E: Understands the composition, formative processes, and history of the Earth, the solar system and the universe
(Earth and Space Science)**

	Family	Workplace	Community
Pre-Literacy	Students observe and keep a record of the changes of an object's shadow during the course of a day and investigate the source of the variation. (<i>M – PL: E</i>)	Students identify items in the workplace made of basic earth materials. (<i>W – PL: B2</i>)	Students identify possible geological hazards in the community (rockslides, flooding in washes, etc.) and recommend ways to avoid them. (<i>W – PL:B2</i>)
ABE I	<p>Students identify items in the home that can be recycled (e.g., paper, newspaper, aluminum cans, plastics, etc.). With the plastics, look for the symbol for recycling (three arrows curved into the shape of a triangle). Devise a plan to get the family to participate in recycling these items.</p> <p>Students observe and record the shape of the moon for several months, then make drawings to predict what will happen in the next week.</p>	Students identify the seasons, their characteristics (e.g., amount of daylight, general temperature range, weather patterns), and calendar events associated with them. Observe and note how the changing of the seasons affects the people they work with, as well as the general atmosphere of the office/workplace.	<p>Students explain and describe how physical environments change due to human activity (e.g., building housing developments, utilizing recreational areas, damming rivers).</p> <p>Students collect and record weather data and note how human activities are affected by it. (<i>M – ABE I: B, E</i>)</p> <p>Students investigate a local environmental issue, such as air or water pollution. Evaluate possible solutions. Identify the best solution and modify if necessary.</p>
ABE II	<p>Students do some stargazing with a constellation chart or guide. See how many constellations they and members of their family can recognize.</p> <p>Students identify planets that are visible in the night sky.</p>	Students identify items in the office/workplace that are made from limited (natural) resources. Investigate possible alternatives (e.g., using items made of man-made materials, items made from recycled goods, altering procedure that utilizes limited resources items, etc.). Use findings to determine the best solution for decreasing the overall consumption of limited resources items.	<p>Students investigate the causes and problems associated with the “Greenhouse Effect.” Identify the culprits responsible for breaking down the ozone layer in the Earth’s atmosphere. Evaluate possible solutions. Research what is being done on global, national, and local levels, and devise a plan as far as what they can do on a personal level to help slow global warming. (<i>W – ABE II: B3</i>); (<i>R – ABE II: B2,6&7</i>)</p> <p>Students use the Internet to investigate the health effects of long-term space travel. (<i>R – ABE II: B2,6&7</i>)</p>

ABE III	<p>Students investigate old buildings and/or headstones in local cemetery for evidence of differential weathering and explain any differences found.</p> <p>Students create a model that demonstrates how the tilt of the Earth causes seasonal changes.</p> <p>Students compare and contrast planets in the solar system. (<i>W – ASE I: B2</i>)</p>	<p>Students examine building to identify safest place(s) to be in case of extreme weather and/or earthquake and develop plan for all personnel in case of such event. (<i>W – ABE III: B3</i>)</p>	<p>Students identify a place subject to periodic flooding, evaluate the positive and negative consequences of flooding, study different ways of maintaining, reducing or eliminating the likelihood of flooding, and make recommendations for appropriate land use. (<i>R – ASE I: B2&5</i>); (<i>W – ABE III: B2</i>)</p>
ASE I / II	<p>Students identify products using recycled resources and compare their quality and price to similar products using virgin resources. (<i>W – ASE II: B1</i>)</p>	<p>Students initiate a recycling project and determine the costs and convenience involved in collection, transportation and sales of collected products.</p>	<p>Using graphs, students chart the change in days' lengths and average temperatures for at least six months. Correlate the Earth's tilt to the results. (<i>M – ASE I: B</i>)</p>

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